

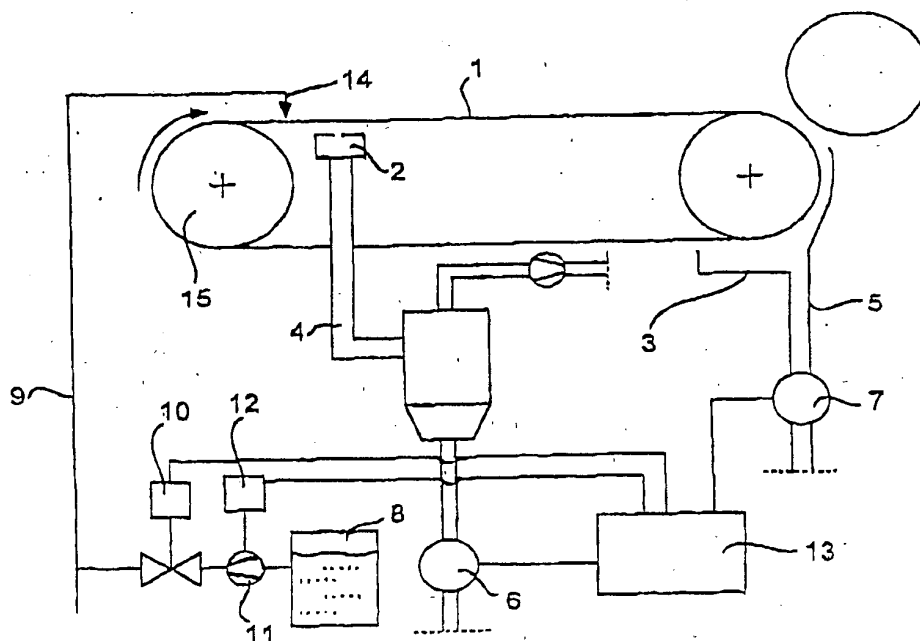
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/FI98/00300 (22) International Filing Date: 7 April 1998 (07.04.98) (30) Priority Data: 971502 10 April 1997 (10.04.97) FI (71) Applicant (for all designated States except US): ECOPUMP OY [FI/FI]; Tornatorintie 3, FIN-48100 Kotka (FI). (72) Inventor; and (75) Inventor/Applicant (for US only): KARVINEN, Juha [FI/FI]; Mäyräntie 3 C 16, FIN-49210 Huntjärvi (FI). (74) Agent: OY HEINÄNEN AB; Annankatu 31-33 C, FIN-00100 Helsinki (FI).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published With international search report. In English translation (filed in Finnish).	

(54) Title: PROCEDURE FOR WASHING THE FABRICS OF A PAPER MACHINE OR EQUIVALENT



(57) Abstract

Procedure for the washing of a fabric from a paper machine or equivalent, in which procedure a washing fluid is applied to the fabric. In the procedure, the liquid quantity removed from the fabric is measured at least one point and, based on the liquid quantity measurement, the dosage of washing chemical to be applied to the fabric is regulated.

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PROCEDURE FOR WASHING THE FABRICS OF A PAPER MACHINE OR EQUIVALENT

The present invention relates to a procedure as defined in
5 the preamble of claim 1.

In prior art, procedures are known in which the fabrics
used in a paper machine or equivalent, such as wires and/or
felts, are washed with various chemicals to extend their
10 service life. The washing is performed either continuously
while the machine is running or periodically e.g. during
down time.

An essential factor in the washing of the fabrics is the
15 accuracy of dosage of chemicals. If an overdose of chemicals
is used, this may have adverse effects on the quality
of the paper being produced and/or to the runnability of
the paper machine. In addition, the operating costs are increased
because the chemicals are relatively expensive. On
20 the other hand, if too small amounts of chemicals are used,
the washing result will be impaired.

The object of the present invention is to achieve a new
type of procedure for the washing of fabrics used in a paper
25 machine or equivalent, designed to avoid the drawbacks
of prior-art techniques.

The invention is characterised by what is presented in the
claims.

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The invention provides numerous significant advantages. The
procedure allows accurate optimisation of the amount of the
washing chemical being used. The procedure also makes it
possible to maximise the service life of the fabric. The
35 fabric retains the desired constitution throughout its useful
life, allowing a good runnability of the paper machine
to be maintained. By using the arrangement of the invention,
the amount of washing chemical need not necessarily

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be measured at all, but the dosage can be effected based solely on measurements of the liquid removed. The arrangement of the invention makes it possible to optimise the chemicals costs.

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In the following, the invention will be described in detail by the aid of an example by referring to the attached drawing, which presents a diagram representing an arrangement according to the invention.

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The figure shows a simplified representation of an apparatus in the wire and/or press section of a paper machine or the like. The apparatus comprises at least one set of means 15 for moving a fabric 1, such as a felt or wire. The apparatus comprises liquid removal elements 2, 3, such as suction boxes and/or dewatering troughs and exhaust pipes 4, 5 communicating with them, and measuring devices 6, 7 connected to the dewatering elements for the measurement of the liquid quantity. The amount of liquid removed from the fabric e.g. by means of suction boxes 2 and/or dewatering troughs 3 is measured at at least one point. The supply of washing chemicals is adjusted based on these efflux measurements. The solution presented in the figure comprises a container 8 from where a washing chemical is supplied into at least one pipe 9, from which it is passed onto the fabric 1 to be washed, e.g. using at least one nozzle 14. The regulation of the washing chemical dosage is controlled on the basis of data adjusted or programmed on the basis of the liquid quantity measurements. Regulation can be effected using e.g. a valve element 10 and/or by influencing the operation of a pump 11, e.g. by adjusting the operating speed of the pump motor 12 or using intermittent operation, or in some other way. The control unit 13 used may consist of e.g. a process computer connected to receive the data provided by the measuring devices measuring the amount of liquid removed and to adjust the chemical dosage based on said data.

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The apparatus comprises at least one liquid collecting element, such as e.g. a suction pipe 4 having at least one slit over which the fabric 1, such as a felt, wire or equivalent, passes, or a so-called nip water trough 3 into which the water is hurled by centrifugal force. Arranged in conjunction with the suction pipe and/or with the exhaust pipe of the liquid collecting element is a liquid quantity measuring device 6, 7. The measurement data from the measuring devices is transmitted to the control unit 13, which regulates the dosage of the washing chemical to be supplied to the fabric. The chemical dosage is regulated by means of regulating elements, such as valves 10 and/or by regulating the yield of a pump element 11.

15 It is obvious to the person skilled in the art that the invention is not restricted to the embodiments described above, but that it may be varied within the scope of the following claims.

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CLAIMS

1. Procedure for the washing of a fabric in a paper machine or equivalent, in which procedure a washing fluid is applied to the fabric (1), characterised in that the liquid quantity removed from the fabric is measured at at least one point and, based on the liquid quantity measurement, the dosage of washing chemical in the washing fluid to be applied to the fabric is regulated.
2. Procedure as defined in claim 1, characterised in that the dosage of washing chemical is regulated by means of regulating devices (10, 11, 12, 13).
3. Procedure as defined in claim 1 or 2, characterised in that the liquid quantity is measured in at least one exhaust pipe (4, 5).
4. Procedure as defined in any one of claims 1 - 3, characterised in that the dosage of washing chemical is regulated by means of a valve element (10) and/or by varying the yield of a feed pump (11).
5. Procedure as defined in any one of claims 1 - 4, characterised in that the dosage of washing chemical is regulated manually and/or automatically in accordance with pre-programmed data.
6. Procedure as defined in any one of claims 1 - 5, characterised in that the regulation of the dosage of washing chemical is effected using a control unit (13).
7. Apparatus for the washing of fabrics in a paper machine or equivalent, in which the fabric is moved by means of motion elements such as rolls, said apparatus comprising at least one element (9) for passing a washing fluid to the fabric (1) and elements (2, 3) for removing at least some of the liquid from the fabric (1), characterised

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in that the apparatus is provided with elements (6, 7) for measuring at least some of the liquid quantity removed from the fabric (1), said elements being connected to a control unit (13), which regulates the dosage of washing chemical by means of regulating elements (10, 11, 12) based on the liquid quantity measurement data.

8. Apparatus as defined in claim 7, characterised in that the regulating elements consist of at least one valve element (10) and/or means for regulating the yield of a pump element (11).

9. Apparatus as defined in claim 7 or 8, characterised in that the elements (6) for measuring the liquid quantity removed from the fabric are disposed in at least one exhaust pipe (4), which has at least one slit over which the fabric (1), such as a felt, wire or equivalent, runs, at least some of the liquid quantity removed from the fabric being passed into said exhaust pipe.

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10. Apparatus as defined in any one of claims 7 - 9, characterised in that the liquid quantity removed from the fabric is measured in an exhaust pipe (5) connected to a trough (3) or a similar water collecting element.

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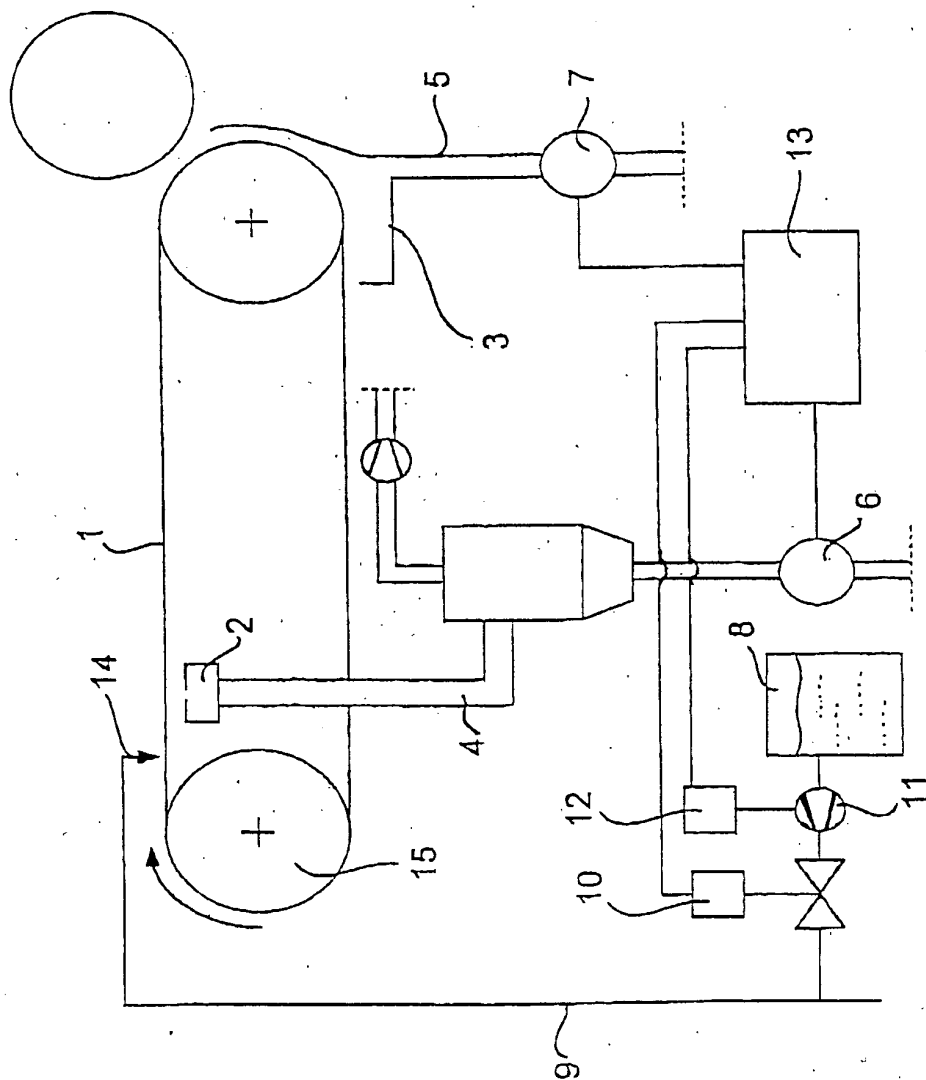


Fig 1

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INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC6: D21F 1/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC5: D21F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DIALOG: ALLSCIENCE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9612064 A1 (ECOPUMP OY), 25 April 1996 (25.04.96) -----	1,7

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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